DOCUMENTATION OF TEKPS

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PURPOSE

In the summer of 1987, MRL acquired another laser printer (the Texas Instruments Omnilaser 2115). This printer has a dot resolution of 300 points per inch in both the vertical and horizontal directions. With this resolution the laser printer has the potential of producing publication quality graphics.

The language understood by the Omnilaser 2115 is postscript. Postscript is a very versatile language for text and graphics, and is rapidly becoming the standard interface language for laser printers.

One of the graphic languages currently used at MRL is TEKTRONIX 4014 PLOT10. This is the graphic language used by the interactive graphical/statistical program DATAPLOT, and also by the finite element pre- and post-processing programs.

MRL extensively uses a computer typesetting language called TEX to produce memos and reports. TEX produces a device independent file called a DVI file. This DVI file is converted to a postscript file by a program called PSPRINT prior to being sent to the laser printer. TEX has the capability of including postscript files directly, however. Thus, if figures and graphs have been converted to postscript, then it is possible to insert these directly into a TEX memo or report. This then was an additional reason to write a utility program to convert graphic information to postscript.

This report describes an interface utility, called TEKPS, that converts TEKTRONIX PLOT10 data to postscript data.

USING TEKPS

TEKPS has been made into a VAX/VMS DCL command and is called as follows:

```
$ TEKPS/qualifier1/qualifier2/---     filename.typ
```

The various qualifiers available and their function are described in the following section. If no filetype is given then ".typ" is assumed to be .TEK. The POSTSCRIPT output file produced is called filename.PS.

The file produced can be plotted on the laser printer and/or inserted into a TEX file. To send filename.PS directly to the laser the user must call PSPRINT as follows.

```
$ PSP      filename.PS
```

On line documentation is available for TEKPS on the system help file. This can be accessed in the usual manner.

```
$ HELP TEKPS
```

QUALIFIERS

A. /COURIER

/NOCOURIER (default)

In emulating Tektronix hardware characters, TEKPS normally uses Postscript courier bold font. The user can force the use of a courier(nonbold) font instead, by specifying /COURIER.

B. /DISTORT

/NODISTORT (default)

If the /DISTORT qualifier is specified, then the mapping from the "TEKBOX" is made to exactly fill the "PSBOX" even if different scalings in the horizontal and vertical directions are required. The default "/NODISTORT" keeps the scaling in the horizontal and vertical directions equal. The plot may not completely fill the "PSBOX" in this case.

C. /LANDSCAPE

Defines the orientation as /ORIENTATION=1. See the discussion under /ORIENTATION.

D. /LINEWIDTH=n

This defines the width of the line in screen units. The default is /LINEWIDTH=2.

E. /ORIENTATION=n

$0 \leq n \leq 3$

See Figure 1 for the various orientations available. The possible values of n and their meaning are:

n = 0	/PORTRAIT
n = 1	/LANDSCAPE
n = 2	inverted portrait
n = 3	inverted landscape.

F. /PORTRAIT

Defines the orientation as /ORIENTATION=0. See the discussion under /ORIENTATION.

G. /PSBOX=(units,hmin,vmin,hmax,vmax)

This qualifier controls the size and position of the "PSBOX" on the laser page. See Figure 2.

(hmin,vmin) and (hmax,vmax) define the corner co-ordinates of the "PSBOX" in units of "units". The origin of (h,v) depends on the orientation. The origin associated with each orientation is shown in Figure 1.

"units" must be one of the following:

"SC" - Screen(Postscript) co-ordinates, 72 dots/inch

"IN" - In inch units.

"CM" - In centimeter units.

"MM" - In millimeter units.

The default box depends on the orientation.

In "/LANDSCAPE" orientation /PSBOX=(SC,72,72,720,540)

and in "/PORTRAIT" orientation /PSBOX=(SC,72,72,540,70).

H. /TEKBOX=(units,xmin,ymin,xmax,ymax)

This allows the user to specify a box or window on the Tektronix 4014 screen. This box is mapped into the PSBOX. See Figure 2.

The units used with (xmin,ymin,xmax,ymax) can be:

"SC"	Tektronic Screen	$0 \leq$ xmin,xmax ≤ 4095,	$0 \leq$ ymin,ymax ≤ 3120
"DP"	Dataplot Screen	$0 \leq$ xmin,xmax ≤ 100,	$0 \leq$ ymin,ymax ≤ 100
"IN"	Inches	$0 \leq$ xmin,xmax ≤ 14.28,	$0 \leq$ ymin,ymax ≤ 10.89
"CM"	Centimeters	$0 \leq$ xmin,xmax ≤ 36.27,	$0 \leq$ ymin,ymax ≤ 27.66
"MM"	Millimeters	$0 \leq$ xmin,xmax ≤ 362.7,	$0 \leq$ ymin,ymax ≤ 276.6

TABLE 1
SUMMARY OF TEKPS COMMAND QUALIFIERS

QUALIFIER	VALUE	DEFAULT	PURPOSE
/COURIER /NOCOURIER	none	/NOCOURIER Courier bold font	Determines the Postscript font to be used for tektronix hardware characters
/DISTORT /NODISTORT	none	/NODISTORT	Determines whether TEKBOX can be distorted when mapped to PSBOX
/LANDSCAPE	none	/LANDSCAPE	Equivalent to /ORIENTATION = 1
/LINEWIDTH	= n	n = 2	Specifies the linewidth used by the laser
/ORIENTATION	= n $0 \leq n \leq 3$	n = 1 (/LANDSCAPE)	Determines on orientation of plot on the laser page n = 0 /PORTRAIT n = 1 /LANDSCAPE n = 2 inverted portrait n = 3 inverted landscape
/PORTRAIT	none	/LANDSCAPE	Equivalent to /ORIENTATION = 0
/PSBOX	(units, h_{min}, v_{min}, h_{max}, v_{max}) units = SC|IN|CM|MM	/LANDSCAPE (SC, 72, 72, 720, 540) /PORTRAIT (SC, 72, 72, 540, 720)	Specifies a box on the laser page into which TEKBOX is mapped
/TEKBOX	(units, x_{min}, y_{min}, x_{max}, y_{max}) units = SC|DP|IN|CM|MM	(SC, 0, 0, 4095, 3120)	Determines the window in the tektronix screen to be mapped to PSBOX

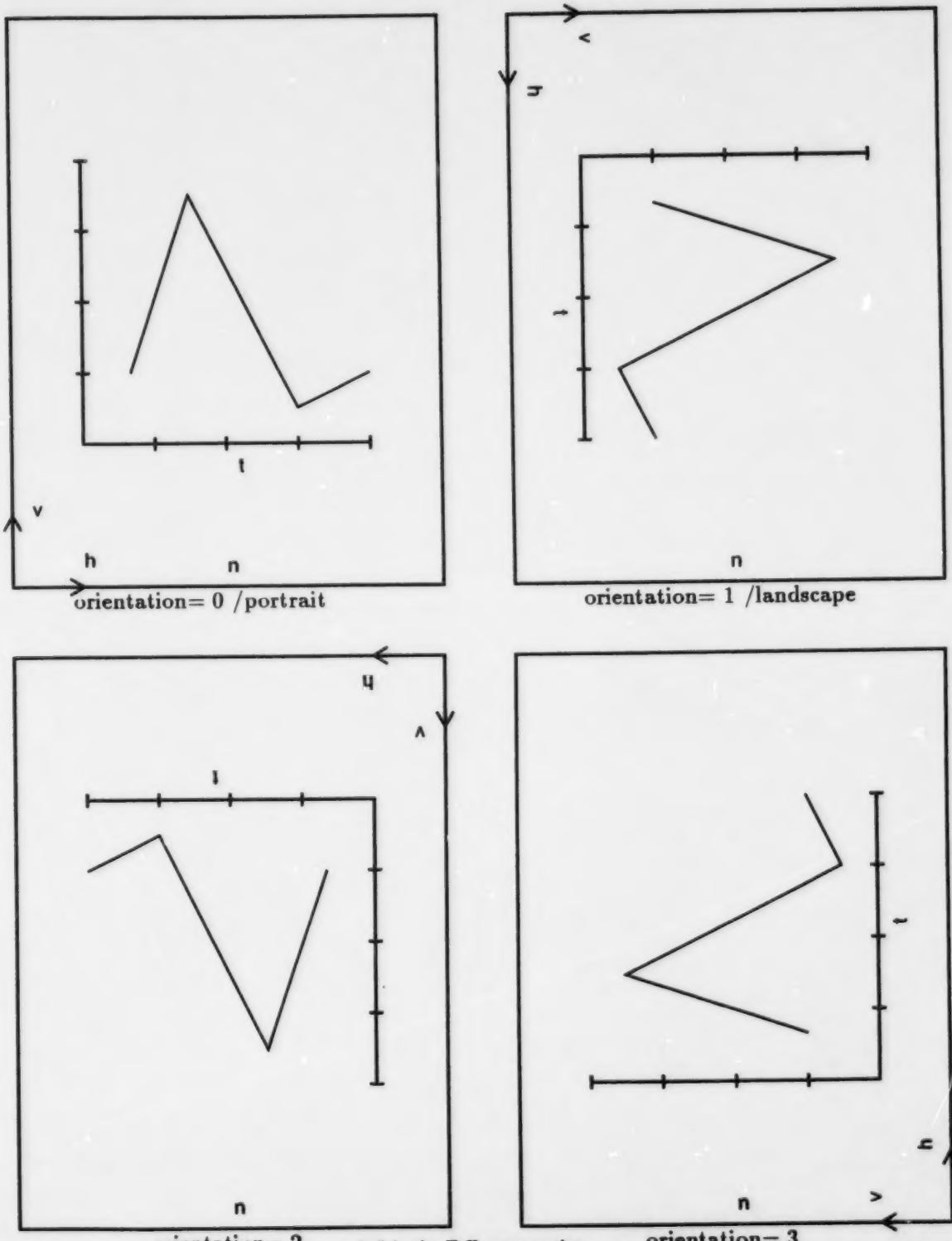

FIGURE 1. Definition of Orientation

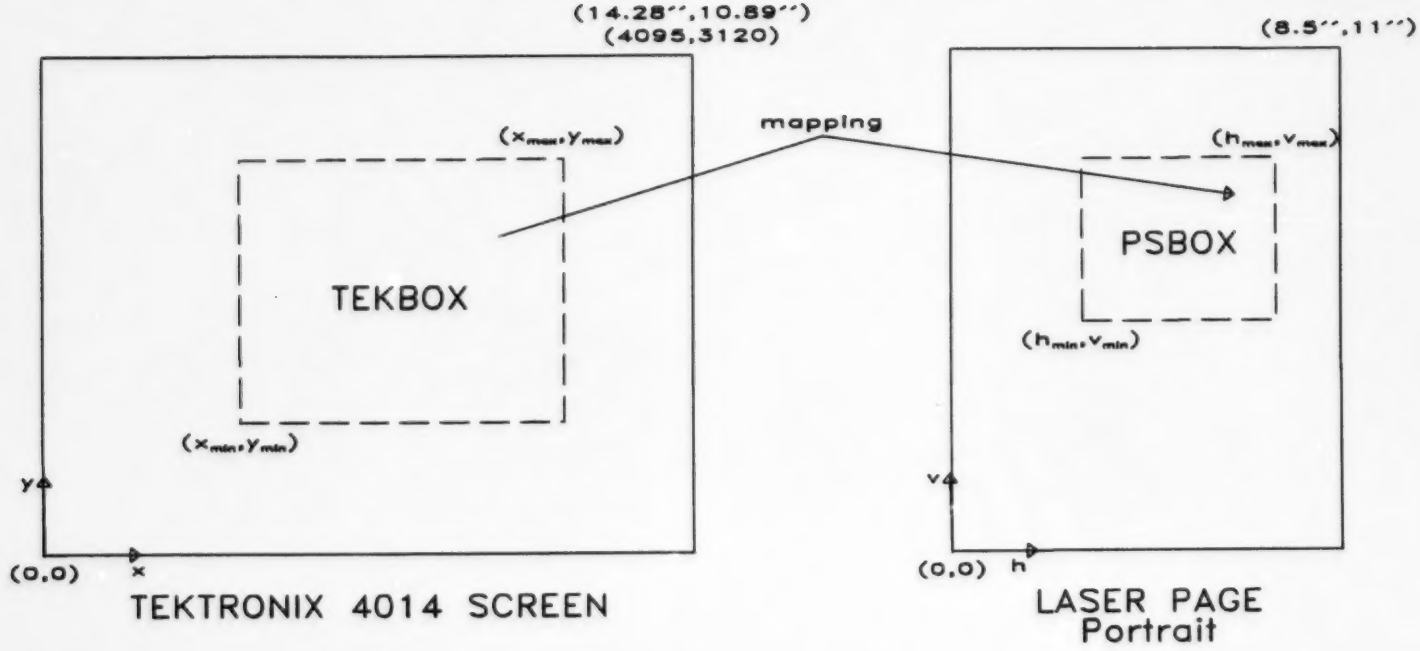

FIGURE 2. MAPPING TEKBOX INTO PSBOX

EXAMPLE

Figure 3 shows and example of the type of output that can be produced. The graph was created using DATAPLOT.

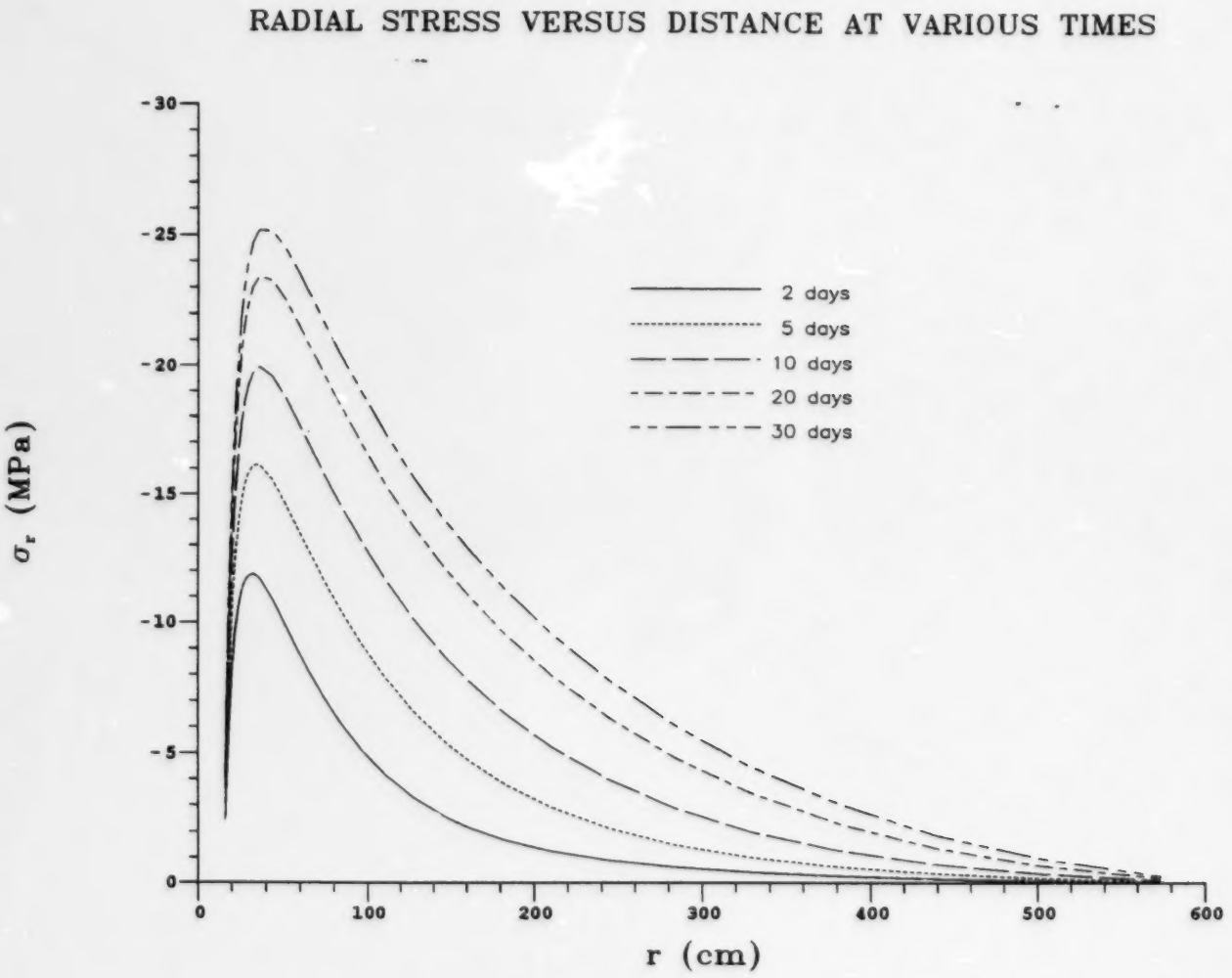

FIGURE 3. EXAMPLE OUTPUT